PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Artcle 36 and Rule 70)

Applicant's or agent's file reference YL03002PCT	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. **PCT/KR2003/002034**	International filing date *(day/month/year)* **02 OCTOBER 2003 (02.10.2003)**	Priority date *(day/month/year)* 11 OCTOBER 2002 (11.10.2002)

International Patent Classification (IPC) or national classification and IPC

IPC7 C07D 413/10

Applicant

B & C BIOPHARM CO., LTD. et al

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 3 sheets, including this cover sheet.

   [X] This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 14 sheets.

3. This report contains indications relating to the following items:

   - I [X] Basis of the report
   - II [ ] Priority
   - III [ ] Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV [ ] Lack of unity of invention
   - V [X] Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI [ ] Certain documents cited
   - VII [ ] Certain defects in the international application
   - VIII [ ] Certain observations on the international application

Date of submission of the demamd	Date of completion of this report
11 MAY 2004 (11.05.2004)	01 FEBRUARY 2005 (01.02.2005)

Name and mailing address of the IPEA/KR

Korean Intellectual Property Office
920 Dunsan-dong, Seo-gu, Daejeon 302-701,
Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

LEE, Jae Jeong

Telephone No. 82-42-481-5604

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International aplication No.
PCT/KR2003/002034

I. Basis of the report

1. With regard to the elements of the international application:*

☐ the international application as originally filed

☒ the description:
pages 12 , as originally filed
pages , filed with the demand
pages 1 - 11, 13 , filed with the letter of 31/05/2004

☒ the claims:
pages , as originally filed
pages , as amended (together with any statment) under Article 19
pages , filed with the demand
pages 14 - 15 , filed with the letter of 31/05/2004

☐ the drawings:
pages , as originally filed
pages , filed with the demand
pages , filed with the letter of

☐ the sequence listing part of the description:
pages , as originally filed
pages , filed with the demand
pages , filed with the letter of

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language which is

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

☐ the language of publication of the international application(under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination(under Rules 55.2 and/ or 55.3).

3. With regard to any **nucleotide** and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained inthe international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disc losure in the international applicationas as filed has been furinshed.

☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages

☐ the claims, Nos.

☐ the drawings, sheets

5.

☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box(Rule 70.2(c)).**

* *Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed." and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).*

** *Any replacement sheet containing such amendments must be referred to under item I and annexed to this report.*

INTERNATIONAL PRELIMINARY EXAMINATION

International aplication No.
PCT/KR2003/002034

V. **Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	1 - 3	YES
	Claims		NO
Inventive step (IS)	Claims	1 - 3	YES
	Claims		NO
Industrial applicability (IA)	Claims	1 - 3	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

Reference is made to the following documents:

D1: WO 0178648 A2 (Dong Wha Pharm. Ind. Co., Ltd.) 25 Oct. 2001
D2: EP 0187705 A2 (Norwich Eaton Pharmaceuticals, Inc.) 16 July 1986
D3: US 3878206 (Morton-Norwich Products, Inc.) 15 April 1975
D4: H.R. Snyder, et. al. 'Imidazo[4,5-f]quinolines III : Antibacterial 7-Methyl-9-(substituted Arylamino)imidazo[4,5-f]quinolines', In: Journal of Pharmaceutical Sciences, 1977, 66(8), pp.1204-6

The amended (31-05-2004) claims 1 - 3 of the present invention relates to 6-methylpyridine derivatives useful as an antiviral agent, and more particularly to novel 6-methylpyridine derivatives having an excellent inhibitory effect on replication of Hepatitis C virus (HCV), a method for preparing thereof, and an antiviral pharmaceutical composition comprising the compound as an active ingredient.

D1 discloses novel 6-methylnicotinamide derivatives, the process for preparing them, and the pharmaceutical compositions containing said compound as an active ingredient. The 6-methylnicotinamide derivatives of the present invention exhibit their inhibitory activity against the proliferation of HIV, HBV and HCV.
D2 concerns compounds of the class of imidazo[4,5-f]quinolines and methods for enhancing the immune response system of mammals which comprises systemically administering to mammals having a depressed immune function an effective but nontoxic amount of a composition comprising such a compound.
D3 and D4 describe a series of 9-(substituted amino)imidazo[4,5-f]quinolines as an antibacterial agent, particularly effective against Haemophilus vaginalis, a cause of bacterial vaginitis.

Although D1-D4 teach the process for preparing and using various types of 6-methylnicotinamide or imidazo[4,5-f]quinoline derivatives, D1-D4 do not disclose the features of the subject matter of claims 1 - 3, which meet the criteria set forth in PCT Article 33(2), (3) and (4). The 6-methylpyridine derivatives useful as an antiviral agent, a method for preparing thereof, and an antiviral pharmaceutical composition comprising the said compound are not anticipated by any of the references on record.

Thus, the invention described in the present application is considered to be novel, inventive and industrially applicable.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2003/002034

A. CLASSIFICATION OF SUBJECT MATTER

IPC7 C07D 413/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 07 C07D, A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean Patents and Application for Inventions Since 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
CAS online(STN), Medline, Delphion

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 0178648 A2 (Dong Wha Pharm. Ind. Co., Ltd.) 25.Oct.2001 See whole document (Page 14, Compound 4)	1-3
A	EP 0187705 A2 (Norwich Eaton Pharmaceuticals, Inc.) 16.July 1986 See whole document	1-3
A	US 3878206 (Morton-Norwich Products, Inc.) 15. April 1975 See whole document	1-3
A	H.R. Snyder, Jr., C.F. Spencer and R. Freedman, Imidazo[4,5-f]quinolines III:Antibacterial 7-Methyl-9-(substituted Arylamino)imidazo[4,5-f]quinolines, Journal of Pharmaceutical Sciences, 1997, Vol.66(8), pp1204-6	1-3

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents,such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
09 JANUARY 2004 (09.01.2004)	10 JANUARY 2004 (10.01.2004)

Name and mailing address of the ISA/KR	Authorized officer
Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	SIHN, YOUNG SIHN Telephone No. 82-42-481-8162

Form PCT/ISA/210 (second sheet) (January 2004)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/KR2003/002034

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO0178648 A2	25.10.2001	US030092709 A1	15.05.2003
		KR1096176 A	07.11.2001
		AU0148903 A5	30.10.2001
EP0187705 A2	16.07.1986	CA1263378 A1	28.11.1989
		EP0187705 A2	16.07.1986
		JP61210085 A	18.09.1986
US3878206 A	15.04.1975	AU473160 B2	17.06.1976
		AU6545274 A	14.08.1975
		BE816004 A1	06.12.1974
		CH598257 A5	28.04.1978
		DE2427410 A1	09.01.1975
		DK302074 A	03.02.1975
		FR2232318 A1	03.01.1975
		GB1402243 A	06.08.1975
		IL44166 A	31.08.1976
		JP50019775 A	01.03.1975
		NL7406572 A	10.12.1974
		SE391926 B	07.03.1977
		SE7405653 A	09.12.1974
		US3878206 A	15.04.1975
		ZA7400798 A	24.09.1975

/